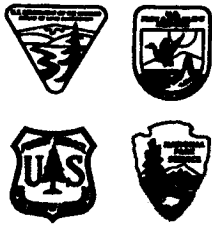


APPENDIX E



ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE WORKSHEETS

"... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Please refer to the accompanying MRDG Instructions for filling out this guide.
The spaces in the worksheets will expand as necessary as you enter your response.

Step 1: Determine if any administrative action is necessary.

Description: Briefly describe the situation that may prompt action.

The presence of non-native invasive plants (NNIP) in the Boundary Waters Canoe Area Wilderness (BWCAW) is largely the result of past human introductions with subsequent spread caused by humans, wildlife, wind, and water. The BWCAW generally has a low abundance of NNIP, the existing infestations are still relatively small and containable, and the spread vectors are known. The majority of these species are restricted to old resort/cabin sites, portages, openings, campsites, old logging roads, and disturbed areas. Most of these NNIP are not shade tolerant which helps inhibit their spread. However, there is a large amount of susceptible habitat in the form of bedrock outcrops and shallow-soils, wetlands, and burned areas. Furthermore, many of the NNIP species are rhizomatous (i.e. have extensive spreading root systems) and cannot be killed by pulling. Susceptible habitat and ineffective control options create a large threat to the ecological integrity of this wilderness. Fortunately, the abundance of NNIP is still relatively low, and these reasons considered together prompt us to action.

Current status in BWCAW:

- 13 acres of NNIP, 900 sites, terrestrial and aquatic plants
- Located at old resort/cabin sites, portages, openings, campsites, old logging roads, and disturbed areas
- SNF - pulling NNIP for past 4 years in BWCAW
- Vectors for spread – campers, animals/pets, fire, and wind
- SNF has a unique opportunity to limit and prevent ecological impacts caused by NNIP

Forest wide, the SNF is using an integrated approach to NNIP management that includes:

- Information/education
- Inventory
- Prevention
- Treatments
- Restorations
- Monitoring
- Partnerships and coordination

To determine if administrative action is necessary, answer the questions listed in A - F on the following pages.

A. Describe Options Outside of Wilderness
Is action necessary within wilderness?

Yes: ☒ No: ☐

Explain:

- Control or containment activities outside the wilderness are important, but are not sufficient alone to contain the spread of NNIP in the wilderness. The infestation has entered the wilderness and is spreading further into the wilderness each year. The area inside the wilderness must be treated in order to have any effect on spread of NNIP.

The actions taken so far outside wilderness have been part of an integrated approach that includes posting informational signs at entry points to the wilderness and conducting herbicide treatments at entry points and adjacent lands.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: ☐ No: ☐ Not Applicable: ☒

Explain:

- This question is not applicable because this proposal does not involve any prohibited uses.

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

- The Executive Order of February 3, 1999 titled *Invasive Species* requires federal agencies to detect non-native invasive species and respond quickly to infestations
- The Noxious Weed Control and Eradication Act of 2004. This updates the Plant Protection Act of 2000 and the federal authorities for noxious weed control.
- The Plant Protection Act of 2000. This defines the federal authorities for noxious weed control.
- BWCA Wilderness Act 1978 - Purposes, SEC. 2. It is the purpose of this Act to provide for such measures respecting the areas designated by this Act as the Boundary Waters Canoe Area Wilderness and Boundary Waters Canoe Area Mining Protection Area as will –
 - 1) provide for the protection and management of the fish and wildlife of the wilderness so as to enhance public enjoyment and appreciation of the unique biotic resources of the region,
 - 2) protect and enhance the natural values and environmental quality of the lakes, streams, shorelines and associated forest areas of the wilderness,
 - 3) maintain high water quality in such areas.

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

- Forest Service National Weed Management Strategy – Four primary goals of Integrated Weed Management are: 1) increase the understanding and awareness, 2) develop and implement integrated weed management at all levels, 3) institutionalize consideration of noxious weeds during the planning phase of projects, 4) develop strong partnerships.
- SNF Forest Plan – The Forest Plan (USDA Forest Service 2004 [see D-VG-1, D-VG-3, D-WL-1, D-WL-6, D-WL-9, O-WL-37, O-WL-38]) guides us to work to establish native vegetation communities and aquatic and terrestrial wildlife habitats that are diverse, productive, healthy, and resilient. Native plants should dominate all terrestrial and aquatic ecosystems, with non-native plants forming at most a minor component. The Forest Plan guides us to reduce the spread of terrestrial or aquatic non-native invasive species that pose a risk to native ecosystems. In the BWCAW, the plan guides us to work toward the removal of non-indigenous species. Specifically, the Plan's objective is to use integrated pest management to:

1. Eradicate any populations of new invaders
2. Contain or eradicate populations of recent invaders that have not become widespread yet
3. Limit the spread of widespread, established invaders.

BWCAW direction in the Forest Plan also guides us to "work toward the removal of non-indigenous species" and eradicate some exotic species to prevent their uncontrolled spread.

- 10 Year Wilderness Stewardship Challenge (10YWSC) – The 10YWSC guides us to bring every wilderness under Forest Service management to a minimum stewardship level by the 50th Anniversary of the Wilderness Act in 2014. There are ten elements to measure success. Element number two addresses non-native plants: "This wilderness was successfully treated for non-native plants."
- Cook County Cooperative Weed Management Area (includes tribal and state) – This is an agreement that is nearing completion that states that the Forest Service will cooperate with Cook County, the MN DNR, Grand Portage Band, and other signatories in invasive species management in Cook County.
- FS policy on Environmental Management – FSM 2150
 - Non-native invasive species are one of the Chief's 4 Threats to the health of the national forest system.
 - 2150.3 (3) – Use pesticides in wilderness only when necessary to protect or restore significant resource values within wilderness or on public or private lands bordering wilderness after receipt of the public or private landowner's permission.
 - 2151.04a (1) – Regional Foresters. Regional Foresters are responsible for reviewing and approving or disapproving all proposed pesticide uses on National Forest System lands. The Regional Forester may delegate this authority to other line officers on a case-by-case basis or by supplement to this code, except for the following: 1. Any pesticide use in Wilderness, which includes Wilderness study areas.
- Forest Service Policy on Wilderness Management - FSM 2320
 - 2320.3 – Policy - 1. Where there are alternatives among management decisions, wilderness values shall dominate over all other considerations except where limited by the Wilderness Act, subsequent legislation, or regulations. 2. Manage the use of other resources in wilderness in a manner compatible with wilderness resource management objectives.

- **2320.2 – Objectives** - 2. Maintain wilderness in such a manner that ecosystems are unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces.
- **2320.5 – Definitions** - 10. **Indigenous Species**. Any species of flora or fauna that naturally occurs in a wilderness area and that was not introduced by man. 11. **Native Species**. Any species of flora or fauna that naturally occurs in the United States and that was not introduced by man. 12. **Naturalized Species**. Any non-indigenous species of flora or fauna that is close genetically or resembles an indigenous species and that has become established in the ecosystem as if it were an indigenous species. 13. **Exotic Species**. Any species that is not indigenous, native, or naturalized.
- **2323.04c – Regional Forester**. Unless specifically reserved to the President (FSM 2323.04a) or the Chief (FSM 2323.04b) or assigned to the Forest Supervisor (FSM 2323.04d) or the District Ranger (FSM 2323.04e), the Regional Forester is responsible for approving all measures that implement FSM direction on the use of other resources in wilderness. Specific responsibilities include but are not limited to: Approving the use of pesticides within wilderness.

Note – The Federal Insecticide, Fungicide, and Rodenticide Act of 1947 definition of 'pesticide' includes 'herbicides.'

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammelled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammelled: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Wilderness is ideally unhindered and free from modern human control or manipulation, or in other words, untrammelled. Action is not necessary to preserve the untrammelled quality of wilderness character. Action to treat the existing NNIP would be a trammeling of wilderness because it represents human control and manipulation of wilderness. This must be weighed against the benefits of restoring more natural conditions.

Undeveloped: **Yes:** ☐ **No:** ☐ **Not Applicable:** ☒

Explain: No structures or installations or use of motorized equipment or mechanical transport are proposed.

Natural: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:

The presence of non-native invasive plants interferes with the natural conditions of the wilderness resource. Whether any action is taken or not, the natural conditions and/or ecosystem functions of wilderness are threatened. The spread of NNIP in the wilderness area is partly caused or enhanced by human actions (seed introduction, spread along trails and in campsites, etc.). Today non-native invasive plant infestations are small and scattered in the BWCAW, but if left unchecked they could spread and have a major impact on the Boundary Waters landscape. To allow invasives to continue spreading would be a direct sign of unintentional human influence. The Wilderness Act (1964) provides specific direction with respect to the "natural" aspect of wilderness character that is pertinent to NNIP management:

- Section 2 (a) Wilderness "shall be administered ... in such manner as will leave them unimpaired for future use as wilderness, and so as to provide for the protection of these areas [and] the preservation of their wilderness character..."
- Section 2 (c) An area of wilderness is...an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable..."

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

The emphasis is on "unconfined type of recreation". Action is necessary to preserve opportunities for an "unconfined type of recreation". The wilderness recreation experience is in part dependent on the wilderness setting representing a natural and native ecosystem. If NNIP are allowed to spread and eventually replace native vegetation, the human experience in wilderness will be affected. Non-native invasive plants can cause changes to vegetation, and these changes can in turn degrade fish and wildlife habitat. For example, many visitors come to the BWCAW for fishing, and if purple loosestrife degrades fish habitat and affects the availability of fishing as an unconfined type of recreation (by degrading connected wetlands that bait or game fish use as rearing areas), then NNIP are causing impacts to this aspect of wilderness character.

Other unique components that reflect the character of this wilderness:

Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

Abundant, clean lakes and streams are a unique component of this wilderness. The Superior NF has the highest percentage of lakes in Region 9, and the BWCAW has the cleanest lakes in the state and country. Action is needed to prevent aquatic and terrestrial invasive plants from causing water quality impacts in the BWCAW. Studies in the western U.S. have shown that erosion is higher at sites invaded by terrestrial NNIP, and studies of aquatic NNIP have shown that dense stands of aquatic NNIP can impede water flow or reduce open water in wetlands. These types of impacts could degrade water quality, and hence action is needed.

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

The spread of NNIP in wilderness would degrade the quality of the recreation experience in wilderness as native species are replaced by non-natives and large scale vegetation changes occur. As NNIP begin to dominate parts of the landscape, they affect wildlife and fish habitat, which subsequently affects opportunities for wildlife viewing and fishing. Similarly, as non-native invasive plants displace native plants, opportunities for wildflower viewing are degraded. Some spiny non-native invasive plants such as Canada or bull thistle can form painful barriers to movement of recreationists. All these aspects of NNIP invasion negatively affect the recreational experience.

Scenic: Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

NNIP have the potential to impact scenic resources by creating monocultures and a lack of diversity in plants/trees on the landscape. By changing the general appearance of the landscape, NNIP could impact the scenic resource. For instance, bedrock exposures that are invaded by non-native invasive hawkweeds become monocultures of hawkweeds. This lack of plant diversity impacts the scenic quality of this habitat and makes it less interesting to a viewer interested in wildflower viewing opportunities.

Scientific: Yes: ☒ No: ☐ Not Applicable: ☐

Explain:

NNIP may have the potential to alter ecosystems species diversity, and distribution. It is possible that this could affect future studies (e.g. baseline of "natural conditions" for climate change studies) of the natural conditions and processes. NNIP can also affect current and on-going scientific studies in the same way.

Education: Yes: ☒ No: ☐ Not Applicable: ☐

Explain: Action is necessary to treat invasive plants in the BWCAW to help support consistency in NNIP education messages. If the Superior chose not to treat our own non-native invasive plants in wilderness, we could be confusing and distorting our NNIP educational messages, since we as an agency emphasize the need for all landowners to cooperate in treating NNIP on their own lands. The Superior NF, Quetico Provincial Park, Friends of the Boundary Waters, and Voyageurs National Park have been working together on coordinating NNIP educational messages across boundaries (for example through the Heart of the Continent canoe trip in 2009 and the NNIP booklet that gets distributed to wilderness visitors), and action on NNIP management is important to provide consistency in these education efforts.

Conservation: Yes: ☒ No: ☐ Not Applicable: ☐

Explain: NNIP tend to interfere with the growth of native plant species and may actually cause populations of native species to decline and degrade the habitat for native fish and wildlife species. In order to establish native vegetation communities and aquatic and terrestrial wildlife habitats that are diverse, productive, healthy, and resilient, action is necessary.

Historical use: Yes: ☒ No: ☐ Not Applicable: ☐

Explain: Historically, Native Americans have harvested wild rice and fish from the lands now known as the BWCAW, and in the last 150 years non-tribal members have as well. NNIP have the potential to impact the historical uses of wilderness by reducing the capacity of the habitat to produce desirable products such as wild rice and fish for tribal members as well as the general public. For example, fluctuating water levels in a wild rice bed could allow purple loosestrife to get a foothold, and if water levels remained low, purple loosestrife could come to dominate a rice bed. The Treaty of 1854 with the Lake Superior Chippewa Tribes established hunting and gathering rights in the Ceded Territory which includes the BWCAW in the Superior NF. Treatment of non-native invasive plants is necessary so that tribal members can continue to fully exercise their treaty rights. If NNIP degrade fish, wildlife, or wild rice habitat, then the ability of members to exercise their treaty rights could be affected, and opportunities for the general public to rice or fish could be affected too.

Step 1 Decision: Is any administrative action necessary in wilderness?

Yes: ☒ No: ☐ More Information needed: ☐

Explain: The Superior National Forest has a unique opportunity to manage invasive plants in the BWCAW while their abundance is still relatively low. Without some sort of control, the infestation is certain to spread and grow many times larger. As a result, the infestation may never be contained and a permanent conversion of vegetation type may occur. The resulting outcome would be an

irreversible change to native plant communities and wildlife and fish habitat.

Confinement to the existing areas is critical and essential if eradication and/or control is ever going to be possible. The existing infestations are still relatively small and containable and the spread vectors are known. Spread beyond the existing areas would threaten the remainder of the wilderness, National Forest lands and movement beyond the wilderness could go into adjacent land not only in the United States but also into Quetico Provincial Park in Canada.

For the above reasons, the decision is to take action and "trammel" the wilderness to protect the natural quality of its' wilderness character.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the minimum activity.

Please refer to the accompanying MRDG Instructions for an explanation of the effects criteria displayed below.

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

Actions common to all alternatives:

- Information/education
- Inventory & early detection
- Prevention
- Treatments
- Mitigation
- Restoration
- Monitoring
- Partnerships and coordination
- Safety

Alternative # 1

Description: No Action

- No non-native invasive plant control measures are taken

Wilderness Character

"Untrammelled" – Alternative 1 would not alter existing trends with respect to trammeling in the BWCAW. No additional crews would be in the BWCAW to treat NNIP, so the quality of trammeling would not change.

"Undeveloped" – There is no effect on the undeveloped quality of wilderness character because there would be no additional use of motorized equipment in non-motorized areas and no facilities to build.

"Natural" – Alternative 1 allows all NNIP infestations in the BWCAW to continue to exist and spread, both within the BWCAW and possibly from the BWCAW to neighboring lands. NNIP would contribute to the degradation of the "natural" aspect of wilderness character in the BWCAW.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation" – No additional crews would be in the BWCAW under Alternative 1, so this alternative would cause no additional impacts to visitor solitude. However, continued existence and spread of NNIP would impact visitors' opportunities for "unconfined types of recreation." Non-native invasive plants can cause changes to vegetation, and these changes can in turn degrade fish and wildlife habitat. In

the long term this could decrease fishing, hunting, wildlife viewing, and wildflower viewing opportunities, which is an impact to this aspect of wilderness character.

Historic and Cultural Resources – This alternative would involve no extra soil disturbance, and thus would minimize any impacts to buried artifacts. However, non-native invasive plants would continue to exist and continue to displace plants with cultural significance such as wild rice.

Water-dominated wilderness – Alternative 1 would allow all NNIP infestations in the BWCAW to continue to exist and spread. Both aquatic and terrestrial NNIP could impact water quality. Studies in the western U.S. have shown that erosion is higher at sites invaded by terrestrial NNIP, and studies of aquatic NNIP have shown that dense stands of aquatic NNIP can impede water flow or reduce open water in wetlands. Alternative 1 would negatively impact this aspect of the BWCAW wilderness character.

Alternative # 2

Description: Manual

- Hand pulling 13 acres/approx 900 sites
- Disposal of pulled material – pack out, burn, pile in sun, throw in woods
- No mechanical transport unless on a legal motor lake
- Crews will avoid camping on high use lakes
- Crews will use available opportunities to educate visitors about NNIP

Wilderness Character

“Untrammelled” – NNIP treatment reduces the untrammelled quality of wilderness because it is human control and manipulation of the wilderness resource. The impacts to the untrammelled quality are about the same for Alternatives 2-4 since the wilderness resource is being controlled and manipulated in each alternative.

“Undeveloped” – There is no effect on the undeveloped quality of wilderness character because there is no use of motorized equipment in non-motorized areas and no facilities to build.

“Natural” – Effective NNIP treatment would enhance the natural quality by restoring native vegetation and reducing the influence of non-native invasive plants on all components of the wilderness resource. However, hand pulling is not an effective treatment for most NNIP in the BWCAW. Hand pulling would only offer moderate control, since most roots would continue to remain in the soil after pulling, and these roots would continue to grow and spread vegetatively. Over the long term, hand pulling can disturb soil and enhance the germination of weed seeds.

“Outstanding opportunities for solitude or a primitive and unconfined type of recreation” – In the short term, the presence of manual treatment crews may adversely affect the wilderness experience of visitors seeking solitude, and trampling and ground disturbance would be evident at sites where hand pulling occurred. These effects would be greater than in Alternatives 3 or 4 because crews would need to repeat the hand pulling treatment year after year because hand pulling does not kill the majority of NNIP in the BWCAW. Some restoration of native vegetation would occur, and this would serve to enhance the wilderness recreation experience.

Historic and Cultural Resources – Manual removal of invasive plants could disturb soil and possibly unearth artifacts – manual treatment sites would be reviewed by heritage personnel for heritage survey needs.

Water-dominated wilderness – Alternative 2 would have the second greatest impact to this quality of the BWCAW. Because of the ineffectiveness of hand pulling for most of the NNIP in the BWCAW, more NNIP would remain on the landscape, with subsequent erosion and impacts to water flow and wetlands.

Alternative # 3

Description: Herbicide Application Only

- Herbicide treatment on approx. 13 ac/900 sites
- Use wipe-on technique adjacent to water to prevent impacts to water quality
- Use hand pump sprayers away from water
- No mechanical transport unless on a legal motor lake
- Herbicides transported in secure watertight container within a second container to reduce risk of spills
- Crews will avoid camping on high use lakes
- Crews will use available opportunities to educate visitors about NNIP

Effects:

Wilderness Character

"Untrammelled" – NNIP treatment reduces the untrammelled quality of wilderness because it is human control and manipulation of the wilderness resource.

"Undeveloped" – There is no effect on the undeveloped quality of wilderness character because there is no use of motorized equipment in non-motorized areas and no facilities to build.

"Natural" – Effective NNIP treatment would enhance the natural quality by restoring native vegetation and reducing the influence of non-native invasive plants on all components of the wilderness resource. Herbicide use would offer a high level of control of invasive plants, and eradication of small NNIP infestations would be possible, with a subsequent high restoration of the "natural" quality of wilderness. The use of herbicides introduces a chemical into the natural environment and is an adverse effect on the "natural" quality. This alternative would have a higher level of herbicide use than Alternative 4, and would therefore have a slightly higher impact on the "natural" quality of the BWCAW.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation" – In the short term, the presence of herbicide treatment crews may adversely affect the wilderness experience of visitors seeking solitude. This effect would be less than the hand pull alternative because crews would need to repeat the treatment less often, and this effect would be about the same for Alternative 4, which would require about the same level of effort for NNIP control. However, Alternative 3 may impact some visitors because herbicide use affects their idea of a primitive recreational experience in that herbicide treatments are not a primitive tool. In the long term, the restoration of native vegetation would serve to enhance the wilderness recreation experience.

Historic and Cultural Resources - Chemical treatment of invasive plants would not disturb soil and would have little risk for buried artifacts. This alternative would present the least risk to heritage resources.

Water-dominated wilderness – This alternative would achieve a high level of NNIP control, so there would be a low risk of erosion and water quality impacts from NNIP as described for Alternatives 1 and 2. Because herbicides would be the sole tool used for NNIP control, there is risk (very low but it still exists) of herbicide contamination of water bodies, with very low risk of impacts to human health and water quality.

The risks to human health and water quality are very low because 1) the herbicides involved have very low use rates, very low toxicity, and don't bioaccumulate (i.e. move up the food chain), 2) low NNIP abundance translates to low amount of active herbicide ingredient applied, and 3) application methods will be used that minimize the risk of exposure of visitors and water to herbicides. More detailed documentation of herbicide risk would be found in the EIS.

Alternative # 4

Description: Herbicide Application and Hand Pulling. This alternative would be a combination of alternatives 1 and 2.

- Herbicides would be used for control of leafy and cypress spurge, garlic mustard, Canada thistle, purple loosestrife, orange hawkweed, yellow hawkweed, oxeye daisy, tansy, goutweed, and Tatarian honeysuckle (for more details see discussion under step 2 below)
- Use wipe-on technique adjacent to water to prevent impacts to water quality
- Use hand pump sprayers away from water
- No mechanical transport unless on a legal motor lake
- Herbicides transported in secure watertight container within a second container to reduce risk of spills
- Crews will avoid camping on high use lakes
- Crews will use available opportunities to educate visitors about NNIP
- Hand-pulling would be used for treating: bull thistle, plumeless thistle, and knapweed infestations.
- Disposal of pulled material – pack out, burn, pile in sun, throw in woods

Effects:

Wilderness Character

“Untrammeled” – NNIP treatment reduces the untrammeled quality of wilderness because it is human control and manipulation of the wilderness resource.

“Undeveloped” – There is no effect on the undeveloped quality of wilderness character because there is no use of motorized equipment in non-motorized areas and no facilities to build.

“Natural” – Effective NNIP treatment would enhance the natural quality by restoring native vegetation and reducing the influence of non-native invasive plants on all components of the wilderness resource. Herbicide use, combined with selective hand-pulling of tap-rooted NNIP (which effectively kills them), would offer a high level of control of invasive plants, and eradication of small NNIP infestations would be possible, with a subsequent high restoration of the “natural” quality of wilderness. The use of herbicides introduces a chemical into the natural environment and is an adverse effect on the “natural” quality. However, this alternative would use slightly less herbicide than Alternative 3, and would therefore have the greatest benefit to the “natural” quality of the BWCAW of any alternative.

“Outstanding opportunities for solitude or a primitive and unconfined type of recreation” – In the short term, the presence of herbicide treatment crews may adversely affect the wilderness experience of visitors seeking solitude. This effect would be less than the hand pull alternative because crews would need to repeat the treatment less often, and this effect would be about the same as for Alternative 3, which would require about the same level of effort for NNIP control. Alternative 4 may impact some visitors because herbicide use affects their idea of a primitive recreational experience in that herbicide treatments are not a primitive tool; however, because less herbicide is proposed for Alternative 4, the impacts on primitive recreational experience would be less than Alternative 3. In the long term, the restoration of native vegetation would serve to enhance the wilderness recreation experience.

Historic and Cultural Resources - Manual removal of tap-rooted invasive plants would occur in this alternative at approximately 5% of the NNIP sites. Although little ground disturbance would occur overall, where it did occur it could disturb soil and possibly unearth artifacts – manual treatment sites would be reviewed by heritage personnel for heritage survey needs. Chemical treatment of invasive plants would not disturb soil and would have little risk for heritage sites. Overall, this alternative would have a slightly higher impact to heritage resources than Alternative 3. **Water-dominated wilderness** – This alternative would achieve a high level of NNIP control, so there would be a low risk of erosion and water quality impacts from NNIP as described for Alternatives 1 and 2. Because herbicides would be used for 95% of the NNIP sites, there is risk (very low but it still exists) of herbicide contamination of water bodies, with very low risk of impacts to human health and water quality.

As described for Alternative 3, the risks to human health and water quality are very low because 1) the herbicides involved have very low use rates, very low toxicity, and don't bioaccumulate (i.e. move up the food chain), 2) low NNIP abundance translates to low amount of active herbicide ingredient

applied, and 3) application methods will be used that minimize the risk of exposure of visitors and water to herbicides. More detailed documentation of herbicide risk would be found in the EIS.

Because less herbicide would be used for Alternative 4 compared to Alternative 3, the risk of effects would be slightly lower for Alternative 4.

Safety Criterion

We are not proposing any prohibited activities in wilderness, so there are no safety concerns which cannot be mitigated concerning the protection of wilderness character, visitors, or employees.

	No Action	Alternative 2	Alternative 3	Alternative 4
Untrammeled	+++	+-	+-	+-
Undeveloped	NA	NA	NA	NA
Natural	---	+-	++	+++
Solitude or Primitive Recreation	---	+-	++	+++
Heritage and Cultural Resources	---	+-	+++	++
Water-dominated Wilderness	---	+-	++	+++
SUMMARY	3+/12-	5+/10-	10+/5-	12+/3-

Step 2 Decision: What is the Minimum Activity?

Please refer to the accompanying MRDG Instructions before describing the selected alternative and describing the rationale for selection.

Selected alternative: Alternative #4

Minimal use of herbicide, by hand/sponge application, will be the treatment method for leafy and cypress spurge, garlic mustard, Canada thistle, purple loosestrife, orange hawkweed, yellow hawkweed, oxeye daisy, tansy, goutweed, and Tatarian honeysuckle. Hand pulling will be used to treat bull thistle, plumeless thistle, and knapweed infestations. Non-mechanical transport (foot and canoe) means will be used to move herbicide, people and supplies to treatment areas. When possible, high use periods of recreation will be avoided and weekday treatment operations will be preferred. Adjacent landowners, the local, state, and tribal governments, and visitors if applicable will be contacted either to assist in the treatments or for information/education purposes. On-going public information and education efforts will be continued to assist with early detection and prevention efforts. Monitoring of treatments would help assure quality control.

Rationale for selecting this alternative (including documentation of safety criterion, if appropriate):

This alternative provides effective control with minimum use of herbicide.

- o Hand-pulling is known to be an effective treatment for knapweed and the biennial plants bull and plumeless thistle if the treatments are repeated until the infestation is controlled. Reliance exclusively on hand pulling as the primary treatment method for all non-native invasive species would not effectively address the increase in occurrence or spread.
- o Hand-pulling of leafy and cypress spurge, garlic mustard, Canada thistle, purple loosestrife, orange hawkweed, yellow hawkweed, oxeye daisy, tansy, goutweed, and Tatarian honeysuckle is not an effective eradication measure because the species have a rhizomatous root system. Hand pulling results in breaking off the root system only a few inches underground. This promotes growth of the species. Plants may not flower if top growth is pulled off, but vegetative spread would continue. Therefore, some form of herbicide use is needed for effective control of these species.

- Use of herbicide on Forest Service lands outside the BWCAW, in conjunction with hand pulling, has been successful at containing these NNIP when spraying is conducted for at least 3 consecutive years.





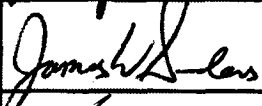

Monitoring and reporting requirements:

Monitoring of all treatment areas will be conducted in all areas to determine effectiveness and minimize future treatments.

Check any Wilderness Act Section 4(c) uses approved in this alternative:

- | | |
|---|--|
| <input type="checkbox"/> mechanical transport | <input type="checkbox"/> landing of aircraft |
| <input type="checkbox"/> motorized equipment | <input type="checkbox"/> temporary road |
| <input type="checkbox"/> motor vehicles | <input type="checkbox"/> structure or installation |
| <input type="checkbox"/> motorboats | |

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:		Ann Schwaller	Natural Resources Wilderness Specialist	11/10/2010
Prepared by:		Jack Greenlee	Ecologist	11-10-10
Recommended:		Sandy Skrien	Public Service Team Leader	10-15-10
Recommended:		Mary Shedd	Natural Resources Team Leader	11-10-2010
Recommended:		Jim Sanders	Forest Supervisor	11-22-10
Approved:		Kent Connaughton	Regional Forester	2/4/11